

IN THE CLAIMS:

Please amend claims 10, 14, 16, and 17. The status of all claims is as follows:

1-9. (Cancelled)

10. (Currently Amended) A medium extending over an area having been selectively written by radiation at a writing time, the medium before writing ~~comprising~~consisting essentially of:

a host matrix; containing

a liquid monomer, in which monomer molecular mobilities are relatively higher, that can be photopolymerized into a solid polymer, in which polymer molecular mobilities are relatively lower, the monomer being at a time before photopolymerization substantially homogeneously doped with

a dye that can be photoexcited to bind to at least the polymer;

wherein upon selective exposure of certain areas of the matrix by radiation at the writing time, both (i) polymerization of the monomer into the polymer and (ii) fixing of the dye to the polymer occur in these exposed areas;

wherein dye molecules that are photoexcited in the selected regions at the writing time so as to bind to at least the polymer molecules become, due to the relatively lower molecular mobility in the polymer, relatively fixed in their bound locations while other un-photoexcited dye molecules not in the selected regions remain relatively more

mobile, resulting in a migration and a redistribution of dye at the writing time from unexposed to photoexposed regions until, dye migration being substantially complete, photopolymerization occurs, locking the migrated and redistributed dye in place at a relatively higher concentration at the selectively photoexposed regions;

wherein after the writing time a concentration gradient of dye molecules in the matrix exists from the unexposed to the exposed areas of the matrix, this concentration gradient resulting from diffusion of the dye from the unexposed to the exposed areas;

wherein by radiation writing dye concentration is increased in the exposed areas relative to the unexposed areas;

wherein, after radiation exposure in selected areas of the matrix stops, an excess concentration of dye molecules in these selectively exposed areas serves as a record of the selective radiation exposure.

11. (Previously Presented) The medium according to claim 10 wherein the dye is photoexcitable by the radiation at the writing time to bind to the monomer as well as to the polymer;

wherein migration and redistribution of the dye at the writing time still transpires; and

wherein, nonetheless to the fact that the dye migrating and redistributing at the writing time also binds the monomer, the dye and the monomer will still

photopolymerize to dye and to polymer more selectively pronouncedly in photoexcited, and exposed, areas as opposed to unexposed areas.

12. (Previously Presented) The medium according to claim 10 further including

an inhibitor of the photopolymerization so that in regions of the matrix encountering low radiation exposure all polymerization is inhibited nonetheless that in other regions of the matrix where radiation is concentrated become fully polymerized.

13. (Original) The medium according to claim 12 wherein the inhibitor of the photopolymerization consists essentially of
oxygen.

14. (Currently Amended) The medium according to claim 10 wherein the host matrix ~~further includes~~ consists essentially of:

binder, in which is contained the liquid monomer and the dye; and
solvent;

wherein the dye has a greater affinity for the polymer than for the binder and the solvent.

15. (Original) The medium according to claim 14 wherein the binder consists essentially of

cellulose acetate propionate;

and wherein the solvent consists essentially of
acetone.

16. (Currently Amended) The medium according to claim 10 wherein ~~the host matrix further comprises~~ the liquid monomer is part of a photopolymer system consisting essentially of:

the liquid monomer;

a crosslinker;

an initiator; and

a photosensitizer.

17. (Currently Amended) The medium according to claim 16 wherein the liquid monomer consists essentially of

dipentaerythritol pentaacrylate;

wherein the crosslinker consists essentially of

1-vinyl-2-pyrrolidinone;

wherein the initiator consists essentially of

N-phenyl glycine; and

wherein the photosensitizer consists essentially of camphor quione.

18. (Previously Presented) The medium according to claim 16 wherein the dye is drawn from the group consisting of

Rhodamine B; and

Bodipy Red.

19. (Previously Presented) The medium according to claim 10 wherein the medium is initially substantially uniformly doped with the dye.

20. (Original) The medium according to claim 10 wherein the dye is fluorescent.

21. (Previously Presented) The medium according to claim 20 that has been selectively illuminated in regions at the writing time so as to write data into the medium serving as an optical memory, wherein

the written medium includes a higher concentration of dye in regions radiatively written than in unwritten regions;

wherein reading of the written medium serving as an optical memory can transpire by introducing fluorescence of the dye.

22. (Previously Presented) The medium according to claim 21 wherein the selectively illuminated regions are in the volumetric spatial form of voxels, the written optical memory thus being a three-dimensional volume optical memory.

23. (Previously Presented) The medium according to claim 10 that has been selectively illuminated in regions at the writing time to write data into the medium serving as an optical memory, wherein

the dye has migrated so as to substantially exist only in radiatively written regions, and to no longer exist in unwritten regions;

wherein reading of the optical memory can transpire by detecting relative presence or absence of the dye.

24. (Previously Presented) The medium according to claim 23 wherein the selectively illuminated regions are in the volumetric spatial form of voxels, the written optical memory thus being a three-dimensional optical memory.

25-33. (Cancelled)